

Product Safety Information

JUL 1982

DPM 957-1

SODIUM HYDROXIDE, SOLUTION (Caustic Soda)

I. PHYSICAL AND CHEMICAL PROPERTIES

Formula: NaOH-Aqua
Formula Weight (Solute): 40.00
Physical State: Liquid (20°C-14.7 psia)
Usual Commercial Form: Liquid
Specific Gravity: 1.525 at 20°C 50% solution
(water 1.0)
Boiling Point (°C): 142 to 148
Color: Water White
Odor: None
Water Miscibility: Miscible in all proportions
pH: Highly alkaline

II. CHEMICAL REACTIVITY

Considerable heat is generated when water is added to sodium hydroxide; boiling and spattering of hot sodium hydroxide may result. Sodium hydroxide can react violently or explosively with many organic chemicals.

III. STABILITY

Due to possible violent reaction with organic compounds, every precaution should be exercised to prevent combining the two products. Also avoid possible mixing of sodium hydroxide with an acid due to the heat generation.

IV. FIRE HAZARD

Sodium hydroxide and its solutions will not burn or support combustion.

V. FIREFIGHTING TECHNIQUES

Although this product will not burn or support combustion if a storage tank is on fire or adjacent to a fire, keep it cool with fire hoses to minimize tank corrosion due to hot sodium hydroxide or possible tank rupture due to heat which will result in spill.

VI. HEALTH HAZARD

In solid or liquid form sodium hydroxide causes burns on contact with all body tissues, frequently with deep ulceration and ultimate scarring. Swallowing usually results in severe injury. Multiple small burns can result from exposure to its dust or mist. Contact with the eyes very rapidly causes severe damage. Inhalation of dusts

or mist of this compound is capable of causing injury to the entire respiratory tract.

1. Ingestion

Ingestion, either of the solid form or of the solution, results in severe damage to the mucous membranes or deeper tissues with which contact is made. As a result, perforation of these tissues may follow, or there may occur subsequent severe and extensive scar formation. Death may result if penetration into vital areas results. Scarring may so constrict or destroy damaged tissues that extensive corrective surgery may be required.

2. Eye Effects

Contact with the eyes, either in solid form or in solution, very rapidly causes severe damage to the eye.

3. Dermal Effects

Sodium hydroxide exerts a marked corrosive action on contact with the skin. Severe burns with deep ulceration and ultimate scarring may result. The chemical is a strong, primary irritant and multiple small burns may result from exposure to its dust or mist. Even dilute solutions, on prolonged contact, exert a destructive effect on tissues, and may lead to severe dermatitis.

4. Inhalation

Inhalation of the dust or concentrated mist of this compound may cause damage to the upper respiratory tract and even to the lung tissue proper, depending upon the severity of the exposure. The effects of inhalation may vary accordingly from mild irritation of the nasal mucous membranes to severe pneumonitis.

5. Threshold Limit Value

A threshold limit value of 2 milligrams per cubic meter of air has been adopted by the American Conference of Governmental Industrial Hygienists.

6. Warning Properties

Signs and symptoms of irritation are inadequate warning of exposure because they are not evident immediately after contact with caustic soda. Injury may result before one realizes that the chemical is in contact with

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the body. Contact of dust or mist with eye, nose or throat tissue usually causes stinging sensation momentarily.

VII. FIRST AID

Whenever first aid is required, it should be given immediately. Prompt treatment may greatly decrease the severity of the effect. In case of injury, the patient should be referred to a physician, even though the injury may appear slight. The physician should be given a full account of the incident.

1. Ingestion

Obtain medical attention as soon as possible.

If sodium hydroxide is swallowed, give large quantities of water or milk to dilute the chemical. Following this, dilute vinegar or fruit juice may be given to accomplish neutralization. Vomiting may occur spontaneously but should not be induced.

2. Eye Contact

Immediately flush the eyes with large quantities of running water for a minimum of 15 minutes. Hold the eyelids apart during the irrigation to ensure flushing of the entire surface of the eye and lids with water. Do not attempt to neutralize caustic with chemicals. Obtain medical attention as soon as possible. Oils or ointments should not be used unless directed by a physician. Continue the irrigation for an additional 15 minutes if the physician is not available.

3. Skin Contact

Immediately flush affected areas with large quantities of running water. Remove contaminated clothing under the shower. Continue washing with water—do not attempt to neutralize with chemical agents. Obtain medical attention unless burn is minor. Oils or ointments should not be used unless directed by a physician.

4. Inhalation

Remove from contaminated atmosphere.

If breathing has ceased, start mouth-to-mouth artificial respiration. Oxygen, if available, should only be administered by an experienced person when authorized by a physician. Keep patient warm and comfortable.

Call a physician immediately.

VIII. PRECAUTIONS FOR NORMAL USE

A minor spill is defined as a small quantity which can be handled routinely considering the physical and hazardous property of the product as well as the location of the spill.

Wherever caustic soda is stored, unloaded, handled, or used, abundant water, preferably running water, should be available for emergency use in dissolving

or diluting and flushing away spilled caustic. Spilled solid forms of caustic may be shoveled up, followed by flushing with water. Dilute acid, preferably acetic acid, may be used to neutralize the final traces of caustic immediately after flushing. Washing or mopping similar leaks may be followed by a liberal covering of sodium bicarbonate for removing the last traces of caustic.

Spills which are not considered to be minor, which are considered to be an emergency, must be handled according to a predetermined plan. For assistance in developing such a plan, contact Stauffer's Technical Service Department.

IX. RECOMMENDED SAFETY EQUIPMENT

Chemical Goggles

Spectacle type safety glasses

Face shield

Hard hats with brims

Rubber or neoprene shoes or boots

Rubber or neoprene gloves

Rubber or neoprene suits

Safety showers and eye wash fountain should be available.

X. CORROSIVITY TO MATERIALS OF CONSTRUCTION

Non-corrosive to rubber at atmospheric temperatures. Solutions are slowly corrosive to iron and copper; solutions may pick up quantities of these and other metals harmful for some uses. At elevated temperatures it causes caustic imbrittlement of steel. Attacks wool and leather clothing and few metals, such as aluminum, tin, and zinc, and alloys containing these metals.

XI. STORAGE REQUIREMENTS

Drums should be stored in an area equipped with an adequate drain with the floor pitched to the drain. Caustic can be stored bulk in tanks built of the correct material of construction. Venting is required and dikes are recommended.

XII. DISPOSAL OF UNUSED MATERIAL

For assistance in disposing of unused material, contact Stauffer's Technical Service Department.

XIII. DISPOSAL CONTAINER

Returnable containers should be drained and returned to shipper. Non-returnable drums should be thoroughly flushed with water before discarding.

XIV. REFERENCES

"Caustic Soda". Manufacturing Chemists Association, Inc., SD-9 (1968).

Stauffer Chemical Company unpublished data.

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